

III. AMENDMENTS TO THE DRAWINGS:

The attached sheets of drawings include changes to FIG. 2 and FIG. 7. These sheets include FIG. 2 and FIG. 7, and replace the original sheet including FIG. 2 and FIG. 7. FIG. 2 has been amended to add the term “PRIOR ART.” FIG. 7 has been amended to add the distance “54.” The attached replacement sheets of the drawings contain no new matter.

Attachment: Replacement Sheets

Annotated Sheets Showing Changes

IV. REMARKS

With the above amendments, the specification has been amended to incorporate the International and Japanese priority applications by reference and to improve grammar and clarity. The attached substitute specification contains no new matter.

The drawings, FIGS. 2 and 7, have been amended. Specifically, FIG. 2 has been amended to add the term "PRIOR ART." Applicants respectively request that the Examiner withdraw the objection to the drawing (FIG. 2) and accept FIG. 2 in the replacement sheet. FIG. 7 has been amended to add a distance "54." Specifically, "54," a first distance extending between centers of adjacent openings of the second fluid supply passage, has been added in FIG. 7 to clearly distinguish the first distance (54) from a second distance (53) and/or a half distance (52) (i.e., half of the first distance (54)). Support for this amendment may be found on p. 40, lines 13-22 of Applicants' substitute specification (clean copy). The attached replacements sheets of the drawings contain no new matter.

Claims 1-15 have been cancelled with prejudice and claims 16-34 have been newly added.

Specifically, new independent claim 16 corresponds to previous claim 5 rewritten in independent form. New independent claim 17 corresponds to previous claim 6 rewritten in independent form.

New independent claim 18 incorporates the subject matter from previous claim 7, and the limitation of "wherein a first space part and a second space part are formed in at least either one of the mandrel and the rotation support hole, wherein the first space part is wider in a radial direction of the rotating body than the second space part, the first space part extends in the radial direction from an outer circumferential surface of the mandrel where supporting portions of the journal supporting part are not positioned to an inner circumferential surface of the rotating body, and the second space part extends in the radial direction from the outer

circumferential surface of the mandrel where supporting portions of the journal supporting part are positioned to the inner circumferential surface of the rotating body” as supported by p. 47, line 4 to p. 62, line 1 (specifically, p. 47, line 21 to p. 48, line 22 and p. 58, line 7 to p. 59, line 13) of Applicants’ substitute specification (clean copy), and FIGS. 8-11 of Applicants’ original disclosure. In addition, new dependent claim 19, depending on new independent claim 19, further limits the claim 18 by reciting “wherein the supporting portions are provided at lower and upper positions of the journal supporting part, respectively, and the first space part extends between the supporting portions at the lower and upper positions of the journal supporting part” as supported by p. 47, line 4 to p. 62, line 1 (specifically, p. 47, line 21 to p. 48, line 22 and p. 58, line 7 to p. 59, line 13) of Applicants’ substitute specification (clean copy), and FIGS. 8-11 of Applicants’ original disclosure.

New dependent claims 20-33, depending either directly or indirectly upon new independent claim 18, respectively, are supported by previous claims 8-11 and 13-15, p. 47, line 4 to p. 62, line 1 of Applicants’ substitute specification (clean copy), and FIGS. 8-11 of Applicants’ original disclosure.

New independent claim 34 corresponds to previous claim 12 rewritten in independent form.

With respect to claim objections against previous claims 6 and 8-12 (Office Action, dated April 2, 2009, p. 2, paragraph 3 to p. 3, paragraph 4), new claim 17, corresponding to previous claim 6, have been corrected by removing “between” and adding “.” at the end of the claims. Claims 20 and 21, supported by previous claim 8, have been corrected by reciting the proper antecedent basis, “a fluid.” Claims 22-23, 24-25, 26 and 28, and 34, supported by previous claims 9-12, have been corrected by reciting the proper antecedent basis, “the fluid.” Applicants respectfully request that the Examiner withdraw the claims objections against previous claims 6 and 8-12, in light of new claims 17, 20-26, 28 and 35 as added.

The present amendment adds no new matter to the above-captioned application.

A. The Invention

The present invention relates broadly to a device adapted for use in correcting a balance of a rotating body in a floating state by a fluid.

In accordance with an embodiment of the present invention, a device for correcting balance of a rotating body is provided that includes elements recited in independent claims 16-19 and 35.

Various other embodiments, in accordance with the present invention, are recited in dependent claims.

An advantage provided by various embodiments of the present invention is that a device for correcting balance of a rotating body can be provided which employs a compressive fluid or a non-compressive fluid, and is able to rotatably and stably support the rotating body in a floating state even if the rotating body is heavy.

B. The Rejections

Claims 5, 6, 11 and 15 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite.

Claims 1, 7-11, 14 and 15 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 4,627,747 to Schönfeld et al. (hereafter “Schönfeld’747”).

Claims 2 and 13 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Schönfeld’747 as applied to claim 1 and further in view of Japanese Patent Application Publication JP 63-176813 to Saburo et al. (hereafter “Saburo’813”).

Claims 3 and 4 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Schönfeld'747 as applied to claim 1 and further in view of Japanese Patent Application Publication JP 04-327022 to Kazuyuki et al. (hereafter "Kazuyuki'022").

Applicants respectfully traverse the Examiner's rejections and request reconsideration of the above-captioned application for the following reasons.

C. Applicants' Arguments

In view of the present amendment, new claims 16, 17, 26 and 28, and 27 and 29, supported by claims 5, 6, 11 and 15, are in compliance with 35 U.S.C. § 112.

a. The Claims Comply with 35 U.S.C. § 112, Second Paragraph

For a claim to comply with 35 U.S.C. § 112, second paragraph, it must (1) set forth what the Applicant regards as the invention and (2) it must do so with sufficient particularity and distinctness so as to be sufficiently "definite." Solomon v. Kimberly-Clark Corp., 55 U.S.P.Q.2d 1279, 1282 (Fed. Cir. 2000). During patent prosecution, definiteness of a claim may be analyzed by consideration of evidence beyond the patent specification, including the inventor's statements to the Patent and Trademark Office. Id.

In view of the present amendment, new claims 16, 17, 26 and 28, and 27 and 29, supported by claims 5, 6, 11 and 15, respectively, are in compliance with 35 U.S.C. § 112, second paragraph, for the following reasons.

Claim 5 is rejected because the phrase of "a half distance between centers of the adjacent openings of the second fluid supply passage is smaller than a distance from the center of each of the openings to an open outer peripheral end of the thrust supporting part" as recited in claim 5 and the phrase of "the half distance 52 between the centers becomes

smaller than the distance 53” as described on p. 40, lines 10-12 of Applicants’ disclosure as originally filed, are mutually contradictory.

In response to the Examiner’s rejection against claims 5, new independent claim 16, corresponding to previous claim 5, has been added to recite “a first distance extends between centers of adjacent openings of the second fluid supply passage, and a second distance extends from a center of each of the openings to an outer peripheral end of the thrust supporting part, and wherein half of the first distance is smaller than the second distance” as supported by p. 40, lines 13-22 of Applicants’ substitute specification (clean copy) and FIG. 7 of Applicants’ replacement sheet.

Claims 6, 11 and 15 are rejected because the phrase “and/or” renders the scope of the claim unascertainable.

In response to the Examiner’s rejection against claims 6, new independent claim 17, corresponding to previous claim 6, has been added to recite “a configuration to switch the fluid supplied to either of the first fluid supply passage or the second fluid supply passage, or both the first and second fluid supply passages,”

In response to the Examiner’s rejection against claim 11 and 15, new claims 26 and 28, supported by previous claim 11, have been added to recite “wherein discharge means ... is provided at the discharge path” and “wherein discharge means ... is provided at the second discharge path,” respectively. New claims 27 and 29, supported by previous claim 15, have been added to recite “wherein discharge means ... is provided at the discharge path” and “wherein discharge means ... is provided at the second discharge path,” respectively.

For all of the above reasons, new claims 16, 17, 26 and 28, and 27 and 29, supported by previous claims 5, 6, 11 and 15, respectively, particularly point out and distinctly claim the invention in compliance with 35 U.S.C. § 112, second paragraph.

b. The Section 102 Rejection

Anticipation under 35 U.S.C. § 102 requires showing the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick, 221 U.S.P.Q. 481, 485 (Fed. Cir. 1984). In this case, the Examiner has failed to establish a prima facie case of anticipation because Schönfeld'747 fails to teach each and every limitation of claims 16-29 and 32-34.

i. Schönfeld'747

Schönfeld'747 relates to a procedure for the balancing of rotating bodies (rotors without journals) and a device for balancing such rotors (Schönfeld'747, col. 1, lines 12-14). A balance machine (1) for a rotating body (18) as illustrated in Fig. 1 (see below) of Schönfeld'747, includes a non-rotating arbor (5) having a vertically arranged swing bridge (4), a plate (11) supporting the lower end section (22) of the rotating body (18), several passages (7), secondary passages (12) each of which is supplied with fluid (40) via a circular conduits (17) (Schönfeld'747, col. 2, lines 65 to col. 3, line 29).

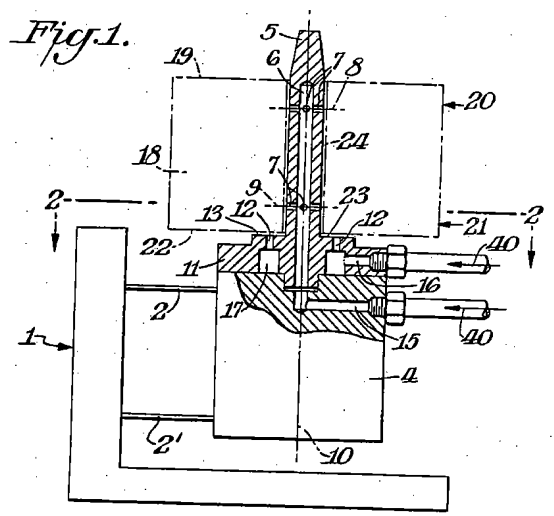


Fig. 1 of Schönfeld'747

Schönfeld'747 does not teach, or suggest, (i) “wherein the second fluid supply passage opens at a plurality of openings on the thrust supporting part, wherein a first distance extends between centers of adjacent openings of the second fluid supply passage, and a second distance extends from a center of each of the openings to an outer peripheral end of the thrust supporting part, and wherein half of the first distance is smaller than the second distance” as recited in new independent claim 16, (ii) “a configuration to switch the fluid supplied to either of the first fluid supply passage or the second fluid supply passage, or both the first and second fluid supply passages, between a compressive fluid and a non-compressive fluid” as recited in new independent claim 17, (iii) “wherein a first space part and a second space part are formed in at least either one of the mandrel and the rotation support hole, wherein the first space part is wider in a radial direction of the rotating body than the second space part, the first space part extends in the radial direction from an outer circumferential surface of the mandrel where supporting portions of the journal supporting part are not positioned to an inner circumferential surface of the rotating body, and the second space part extends in the radial direction from the outer circumferential surface of the mandrel where supporting portions of the journal supporting part are positioned to the inner circumferential surface of the rotating body” as recited in new independent claim 18, and (iv) “wherein recovery means for recovering the fluid is provided at a position confronting an outer periphery of the thrust supporting part” as recited in new independent claim 34.

In addition, Schönfeld'747 does not teach, or suggest, (v) “wherein the supporting portions are provided at lower and upper positions of the journal supporting part, respectively, and the first space part extends between the supporting portions at the lower and upper positions of the journal supporting part” as recited in new dependent claim 19.

A device (50) for correcting a balance of a rotating body of FIG. 7 (see below) (also see FIG. 6 below to understand a basic configuration of a rotatably supporting device) in accordance with the present invention, is provided with a journal supporting part (22) having a mandrel (21), a thrust supporting part (23) constituted by a plate (24), a first fluid supply passage (27), and a second fluid supply passage (29) having a plurality of openings (51) on the thrust supporting part (23). The openings (51) are arranged in such a manner that that a half distance (52), which is half of a first distance (54) that extends between centers of the openings (51), is smaller than a second distance (53) that extends from the center of the opening (51) to the outer peripheral end of the plate (23). New independent claim 16 and Applicants' substitute specification (clean copy), p. 37, line 25 to p. 40, line 22.

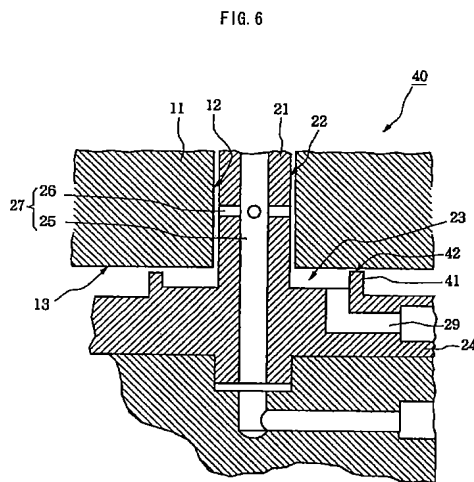


FIG. 6 of Applicants' original disclosure

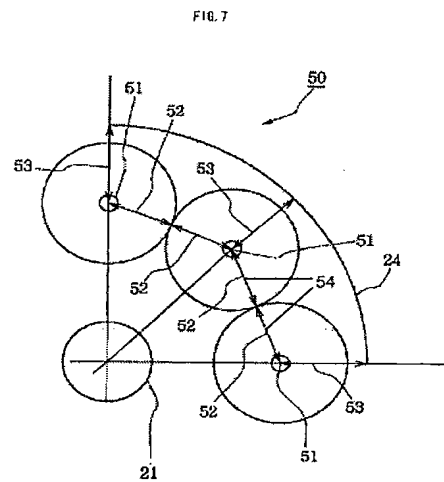


FIG. 7 of Applicants' replacement sheet

However, Schönfeld'747 neither teach nor suggest, a plurality of openings on a thrust supporting part arranged in such a manner as claimed in new independent claim 16.

A configuration to switch the fluid supplied to either of the first fluid supply passage or the second fluid supply passage, or both the first and second fluid supply passages, between a compressive fluid and a non-compressive fluid" as recited in new independent

claim 17, is novel in the present invention. By this configuration, it is possible to limit a used amount of the lubricating oil by floating a rotating body in a non-compressive fluid such as a lubricating oil or the like, and thereafter supplying a compressive fluid such as an air or the like, thereby blowing away the lubricating oil attached to the rotating body to perform cleaning. Furthermore, with respect to the rotating bodies having different weights, it is possible to secure a floating amount in correspondence to the characteristics of the compressive fluid and the non-compressive fluid, by employing the compressive fluid for the light rotating body and employing the non-compressive fluid for the heavy rotating body, while using the same mandrel. Applicants' substitute specification (clean copy), p. 42, lines 6-25.

On the other hand, Schönfeld'747 does not disclose a configuration to switch the fluid between a compressive fluid and a non-compressive fluid, and the above advantages obtained.

A device (60) for correcting a balance of a rotating body shown in FIG. 9 (see below) (also see FIGS. 10 and 11) in accordance with the present invention, comprises supporting portions (65a and 65b) provided at upper and lower sides of a journal supporting part (62), and a first space part (66) arranged at least any one of the mandrel (21) and the rotation support hole (12), wherein the first space part (66) is formed between the supporting portions (65a and 65b) and widens a space other than a second space at the supporting portions (65a and 65b). New independent claim 18 and Applicants' substitute specification (clean copy), p. 48, line 3-22. In virtue of this first space part (66), it is possible to float the rotating body efficiently while supporting it even if the rotating body is heavy. Applicants' substitute specification (clean copy), p. 14, line 1 to p. 15, line 5.



FIG. 9 of Applicants' original disclosure

In contrast, Schönfeld'747 does not disclose a first space arranged in such a manner as claimed new independent claim 18 and the above advantage obtained.

With respect to new dependent claims 20-29 and 32-33, these claims are either directly or indirectly dependent forms from new independent claim 18. For the reasons discussed above, Schönfeld'747 does not disclose the device for correcting balance of a rotating body according to independent claim 18. Thus, Schönfeld'747 does not disclose the subject matter of dependent claims 20-29 and 32-33.

For all the above reasons, Schönfeld’747 does not anticipate the subject matter of claims 16-29 and 32-34 of the above-captioned application.

c. The Section 103 Rejection

A prima facie case of obviousness requires a showing that the scope and content of the prior art teaches each and every element of the claimed invention, and that the prior art

provides some teaching, suggestion or motivation, or other legitimate reason, for combining the references in the manner claimed. KSR International Co. v. Teleflex Inc., 127 S.Ct. 1727, 1739-41 (2007); In re Oetiker, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992).

In this case, the Examiner has failed to establish a prima facie case of obviousness against claims 18-19 and 30-31, because Schönfeld'747 and Saburo'813, either alone or in combination, does not teach or suggest all the limitations of the claims.

For example, none of the above references shows or suggests the limitation of “wherein a first space part and a second space part are formed in at least either one of the mandrel and the rotation support hole, wherein the first space part is wider in a radial direction of the rotating body than the second space part, the first space part extends in the radial direction from an outer circumferential surface of the mandrel where supporting portions of the journal supporting part are not positioned to an inner circumferential surface of the rotating body, and the second space part extends in the radial direction from the outer circumferential surface of the mandrel where supporting portions of the journal supporting part are positioned to the inner circumferential surface of the rotating body” as recited in new independent claim 18.

i. The Section 103 Rejection against claims 2 and 13 based on the combination of Schönfeld'747 and Saburo'813

The Section 103 Rejection against claim 2 based on the combination of Schönfeld'747 and Saburo'813 is untenable because claim 2 has been cancelled with the present amendment.

In addition, Schönfeld'747 and Saburo'813, either alone or in combination, fails to establish a prima facie case of obviousness against claims 18-19, and 30-31 as supported by previous claim 13 as cancelled, because of the following reasons.

(i). Schönfeld'747

Schönfeld'747 is discussed above.

As admitted by the Examiner (Office Action, dated April 2, 2009, p. 9, lines 6-7), Schönfeld'747 does not teach, or suggest, (i) “an annular projection portion that is provided in an outer peripheral portion of the thrust supporting part or the rotating body, ...” as recited in previous claim 2 as cancelled, and (ii) “wherein an annular projection portion is provided between the thrust supporting part and the rotating body, for holding the fluid” as recited in new dependent claims 30 and 31, supported by previous claim 13 as cancelled, respectively.

However, these are only deficiencies in the disclosure of Schönfeld'747, which does not teach, or suggest, (iii) “wherein a first space part and a second space part are formed in at least either one of the mandrel and the rotation support hole, wherein the first space part is wider in a radial direction of the rotating body than the second space part, the first space part extends in the radial direction from an outer circumferential surface of the mandrel where supporting portions of the journal supporting part are not positioned to an inner circumferential surface of the rotating body, and the second space part extends in the radial direction from the outer circumferential surface of the mandrel where supporting portions of the journal supporting part are positioned to the inner circumferential surface of the rotating body” as recited in new independent claim 18 on which claim 30 depends, and (iv) “wherein the supporting portions are provided at lower and upper positions of the journal supporting part, respectively, and the first space part extends between the supporting portions at the lower and upper positions of the journal supporting part” as recited in new dependent claim 19 on which claim 31 depends.

(ii). Saburo'813

Saburo'813 relates to a bearing device. A bearing device as described in Fig. 1 (see below) of Saburo'813 includes a shaft (1), and a sleeve (2) on which a journal sliding surface and a thrust sliding surface are provided fine grooves (20, 22) for generating a fluid dynamic pressure. When the sleeve (2) is rotated after being given power, lubricating fluid (8) flows in the grooves (20, 22) in a high speed on each sliding part, generating a dynamic pressure by means of a pumping action in compliance with the shapes of grooves, and floating and supporting the sleeve (2) in a non-contact way to the shaft (1). English abstract of Saburo'813.

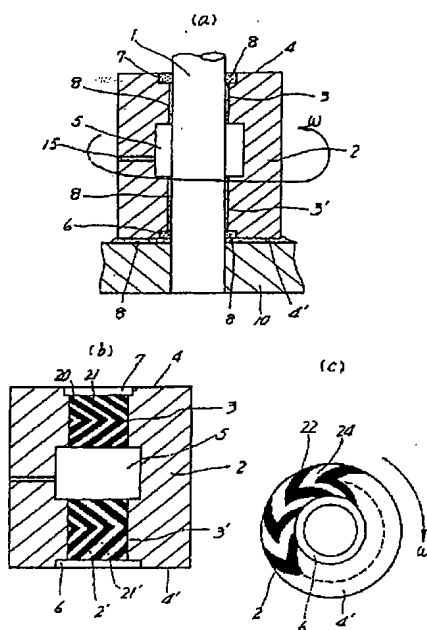


Fig. 1 of Saburo'813

Saburo'813 does not teach, or suggest, (i) “wherein a first space part and a second space part are formed in at least either one of the mandrel and the rotation support hole, wherein the first space part is wider in a radial direction of the rotating body than the second space part, the first space part extends in the radial direction from an outer circumferential surface of the mandrel where supporting portions of the journal supporting part are not positioned to an inner circumferential surface of the rotating body, and the second space part extends in the radial direction from the outer circumferential surface of the mandrel where

supporting portions of the journal supporting part are positioned to the inner circumferential surface of the rotating body” as recited in new independent claim 18 on which claim 30 depends, and (ii) “wherein the supporting portions are provided at lower and upper positions of the journal supporting part, respectively, and the first space part extends between the supporting portions at the lower and upper positions of the journal supporting part” as recited in new dependent claim 19 on which claim 31 depends.

(iii). Summary of the Disclosures

Schönfeld’747 and Saburo’813, either alone or in combination, fails to teach, or suggest, (i) “wherein a first space part and a second space part are formed in at least either one of the mandrel and the rotation support hole, wherein the first space part is wider in a radial direction of the rotating body than the second space part, the first space part extends in the radial direction from an outer circumferential surface of the mandrel where supporting portions of the journal supporting part are not positioned to an inner circumferential surface of the rotating body, and the second space part extends in the radial direction from the outer circumferential surface of the mandrel where supporting portions of the journal supporting part are positioned to the inner circumferential surface of the rotating body” as recited in new independent claim 18 on which claim 30 depends, and (ii) “wherein the supporting portions are provided at lower and upper positions of the journal supporting part, respectively, and the first space part extends between the supporting portions at the lower and upper positions of the journal supporting part” as recited in new dependent claim 19 on which claim 31 depends.

For all the above reasons, no prima facie showing of obviousness has been under against claims 18-19 and 30-31.

ii. The Section 103 Rejection against claims 3 and 4 based on the combination of Schönfeld’747 and Kazuyuki’022

The Section 103 Rejection against claims 3 and 4 based on the combination of Schönfeld’747 and Kazuyuki’022 are untenable because claims 3 and 4 have been cancelled with the present amendment.

III. CONCLUSION

New claims 16, 17, 26 and 28, and 27 and 29, corresponding to claims 5, 6, 11 and 15, are in compliance with 35 U.S.C. § 112.

The Examiner has failed to establish a prima facie case of anticipation against independent claims 16-18 and 34. Therefore, the Examiner has failed to establish a prima facie case against dependent claims 19-29 and 32-33, which depend either directly or indirectly upon independent claim 18. In addition, Applicants have demonstrated that Schönfeld’747 does not teach, or suggest, additional limitation recited by dependent claim 19.

The Examiner has failed to establish a prima facie case of obviousness against dependent claims 30 and 31 because Schönfeld’747 and Saburo’813, either alone or in combination, fails to teach each and every limitation of independent claim 18 on which dependent claims 30 and 31 depend either directly or indirectly.

For all of the above reasons, new claims 16-34 are in condition for allowance and a prompt notice of allowance is earnestly solicited.

The below-signed attorney for Applicants welcomes any questions.

Respectfully submitted,

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